

RDHM-CHPS Research-to-Operations Demonstration - Russian River Basin, CA

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ABSTRACT

The HMT-West activities have included development and calibration of a distributed hydrologic model, the NWS Office of Hydrologic Development's (OHD) Research Distributed Hydrologic Model (RDHM), to prototype the distributed approach for flood and other water resources applications. The HMT-West has applied the RDHM to the Russian River (RR) basin to support assessment of gap-filling weather radars for high resolution precipitation nowcasting and forecasting. The RR RDHM has received attention as a forecast tool to support NWS flash flood operations as well as various water management purposes in the basin, including water supply forecasting and endangered fisheries habitat enhancement.

The objective of this research-to-operations activity is to assess whether a distributed hydrologic modeling approach can provide enhanced hydrologic services for flood and other water resources purposes by the NWS and its partner water management agencies.

This project has involved implementing a CHPS-FEWS standalone instance on an ESRL-PSD workstation and integrating the developed Russian River RDHM model. The CHPS-FEWS was set up to ingest gridded precipitation data feeds to force the RDHM model to continuously maintain carryover states. The Russian River RDHM model is now running hourly via automation in CHPS-FEWS on a workstation at ESRL-PSD. Initial states were developed using archived and disaggregated CNRFC QPE beginning in October 2013. Hydrologic forecasts are based on the HRRR dataset and automatic simulation initializes using 48 hour-old states and forecast out to 24 hours.

During implementation of CHPS-FEWS and RDHM at ESRL-PSD, there has been ongoing coordination with the NWS forecast operations agencies having operational jurisdiction over the Russian River basin. These include the NWS' WFO-MTR, Western Region and the CNRFC. Communications with the operational agencies have involved remote access and training for ESRL-PSD staff, the WFO MTR Service Hydrologist and WRH.

While the current project is intended for demonstration and assessment only we are looking beyond establishing a prototype. With cooperation from OHD, WRH, CNRFC, and WFO-MTR, we are working to inform the development of the concept of operations for distributed modeling to support WFO hydrologic operations. And while we will not implement actual forecasts for dissemination, we will identify constraints and opportunities for enhanced services, and flood and water management applications, which could be sustained by WFO/RFC flash flood operations.